

SCIENTIFIC CONTRIBUTIONS (K. W. Weiler)

Research

- Developed first earth rotation linear and circular polarization synthesis mapping techniques.
- Performed first radio frequency "light bending" tests of General Relativity at the Owens Valley Radio Observatory and refined the experiment with the Westerbork telescope in The Netherlands.
- Developed unique, simple linear polarization synthesis techniques for the Westerbork telescope.
- Participated in the early development of the widely used CLEAN algorithm.
- Developed the techniques for high accuracy circular polarization measurements and published the first and only catalogue.
- Identified, developed, and named the class of supernova remnants (SNRs) similar to the previously "unique" Crab Nebula known as "plerions."
- Established the Low Frequency Variable Source monitoring program at the Institute for Radio Astronomy in Bologna, Italy and participated in the VLBI structure monitoring of these objects.
- Set up the VLBI MKII data processing system at the Max Planck Institute for Radioastronomy in Bonn, Germany.
- Developed new expertise in optical interferometry.
- Added new X-ray expertise with ROSAT studies of supernova remnants.
- Established the new class of radio sources known as radio supernovae (RSNe) and continue to explore the statistics, origins, and physical properties of the objects.
- Developing concepts and designs for space-based radio observatories, particularly at low frequencies.

Management

- Provided quality control, system calibration, scientific contact with users, astronomical and interferometric input to engineers, and supervision of five observers at the new Westerbork telescope (then the world's largest) as it came on line in 1970 and for the initial two years of its operation.
- Set up the routine operating procedures, designed forms, and prepared a user's handbook for the new Westerbork telescope.
- Served on Program Committees (TACs) and other management committees for the Westerbork telescope in The Netherlands and for the 100m radio telescope of the Max Planck Institute for Radio Astronomy in West Germany.
- Assumed responsibility for two small and somewhat inactive programs (Stellar Systems and Motions and Solar System Astronomy) at the National Science Foundation (NSF), with a total budget in FY1980 of \$2.5M, and developed them into vital and expanding programs (Galactic Astronomy and Solar System Astronomy) with a total budget of \$5.4M by FY 1985.
- Designed and implemented new computer programs and management procedures to handle the increased workload of the two NSF programs with only the addition of a half-time secretarial position.
- Devised, promoted, and obtained a special NSF program initiative for studies of Comet Halley with an increment of \$0.5M devoted to increased cometary work. This increment essentially doubled the size of the planetary research program. Served on the Steering Committee of NASA's International Halley Watch.
- Served as the NSF project scientist for the Very Long Baseline Array (VLBA) project and represented it within the government during its processing through the review, consideration, and initial funding steps.
- Headed the Special Projects Section of the Space Science Division at the Naval Research Laboratory which evolved into the Interferometric Research Section of the Remote Sensing Division. This involved supervision of 2-3 Ph.D. research scientists.
- Served as Project Director of the Optical Interferometer Project, a U.S. Naval Observatory/Naval Research Laboratory program to construct an optical interferometer with a budget of ~\$4M/yr. Established the entire project management structure and implemented personnel/facilities growth from ~6 to ~25 FTEs.
- Provided part time assistance to the National Science Foundation as Associate Program Director for the \$8M/yr Advanced Technology & Instrumentation Program.